

# Service Manual

## 01

**Rough Terrain Crane**

**GR-700EX-1**

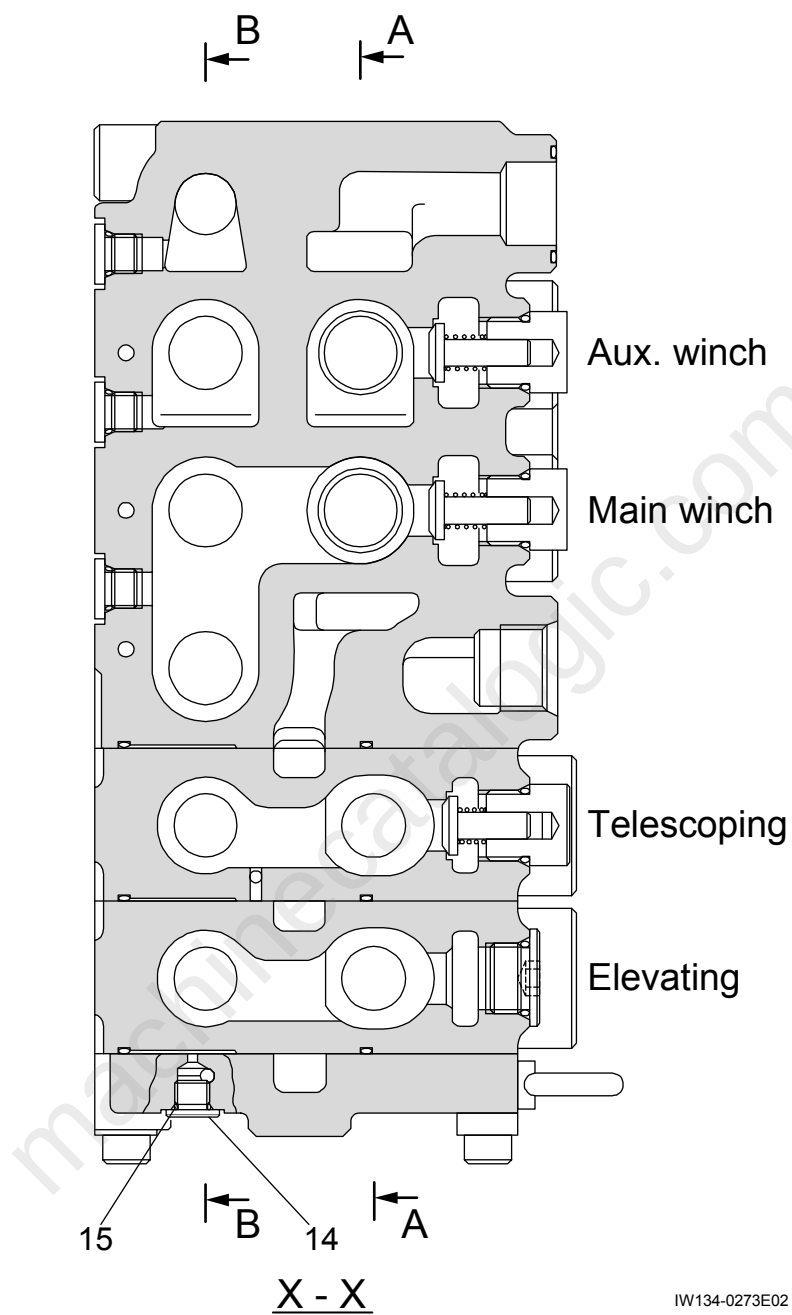
**Model**

**GR-700EXL-1**

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Applicable Serial No. 545960 --

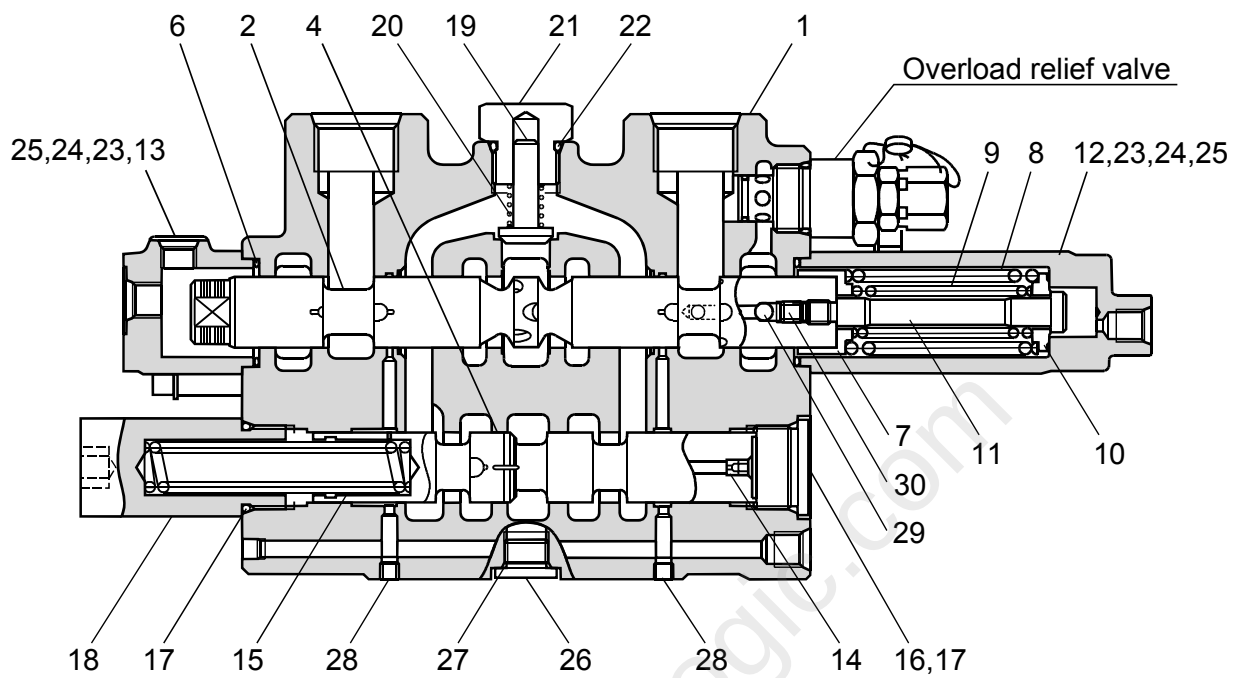
## Hydraulic Pilot Control Valve (Elevating, Telescoping, Winch)



IW134-0273E02

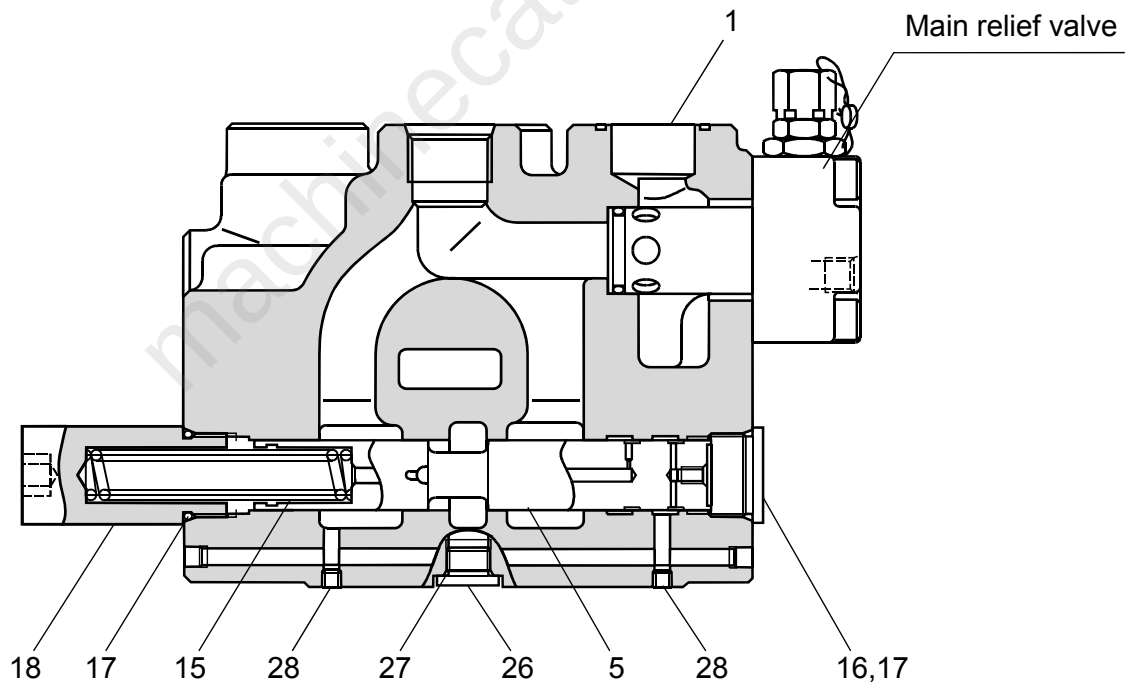
# Hydraulic Pilot Control Valve (Elevating, Telescoping, Winch)

Winch selector valve



C-C (Aux. winch) , D-D (Main winch)

IW134-0270E04



E-E

IW134-0110E07

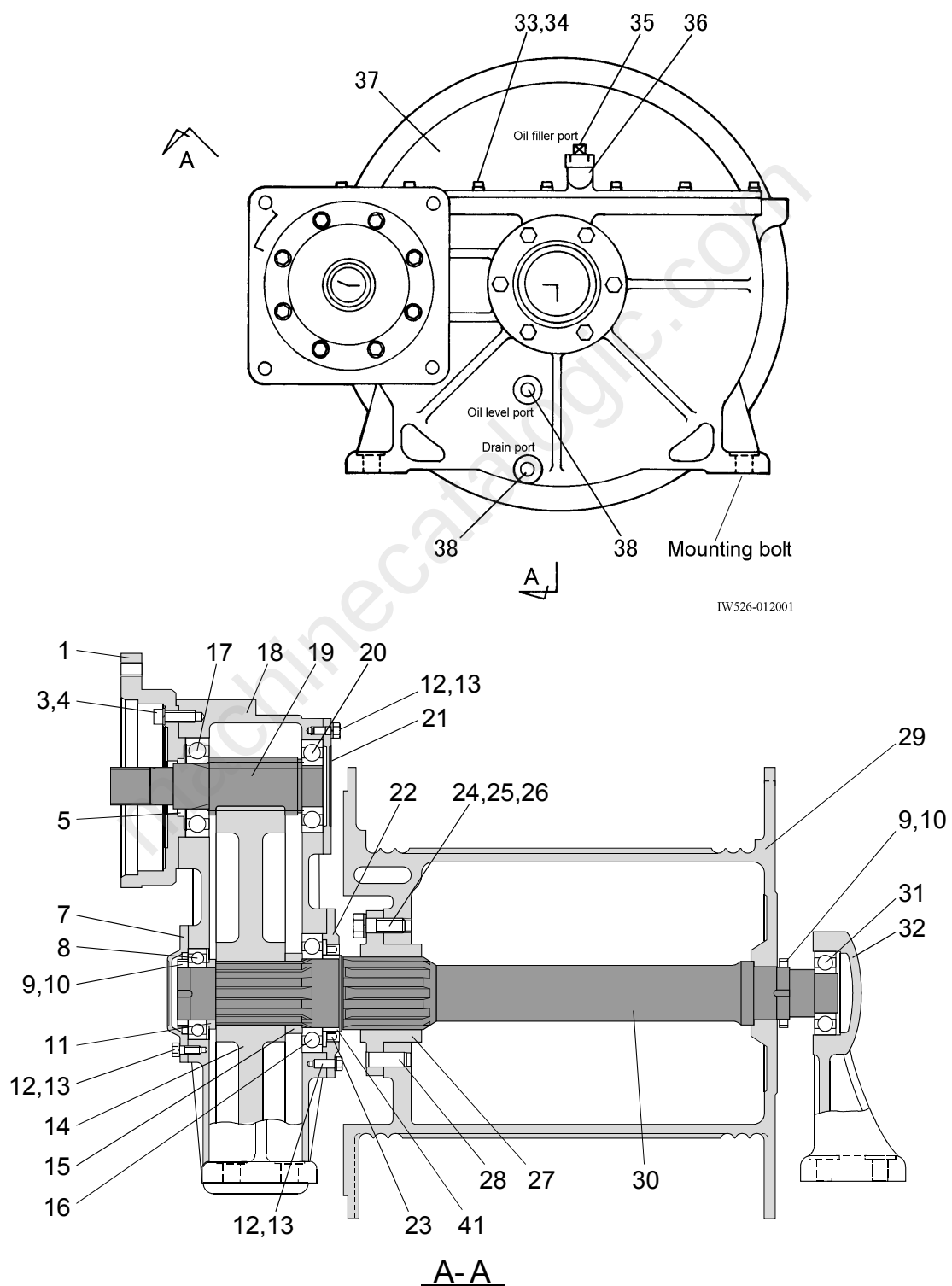
## Winch

## F-2 Winch

## [NOTICE]

◆ There is a case that the appearance and so on differ from the parts for this machine. Although there is not so much difference in functions and disassembly procedures, make sure of the serial number of this machine and the part sales unit described in the parts catalog before starting disassembling operations.

## 1. Structure



IW526-012001

IW526-012002

## Remote Control Valve (Lever)

Thread size and tightening torque

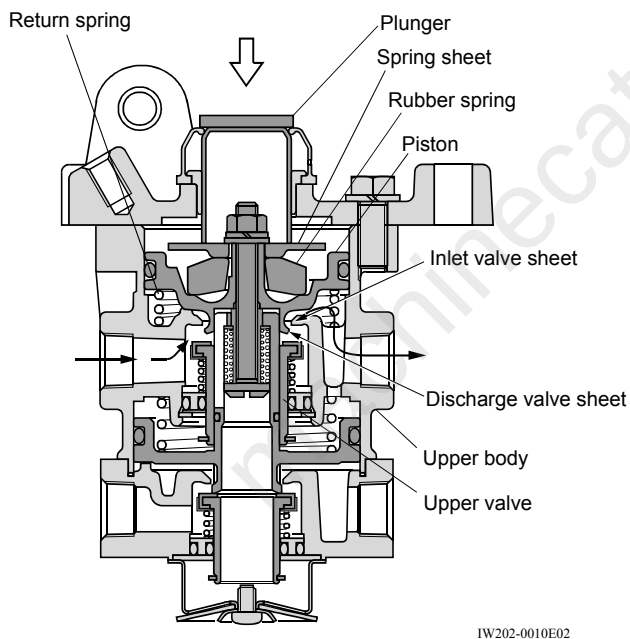
| Sign / Port                                                        | Thread size | Tightening torque |           |         |
|--------------------------------------------------------------------|-------------|-------------------|-----------|---------|
|                                                                    |             | N-m               | kgf-m     | ft-lbf  |
| P, T                                                               | G1/4        | 34.3 - 38.3       | 3.5 - 3.9 | 25 - 28 |
| PORTS 1, 2, 3, 4                                                   | G1/4        | 34.3 - 38.4       | 3.5 - 3.9 | 25 - 28 |
| 125                                                                | M8          | 27.4 - 31.4       | 2.8 - 3.2 | 20 - 23 |
| 161                                                                | R1/4        | 19.6 - 23.6       | 2 - 2.4   | 14 - 17 |
| 172                                                                | M8          | 15.7 - 17.7       | 1.6 - 1.8 | 12 - 13 |
| 411                                                                | M12         | 27.4 - 31.4       | 2.8 - 3.2 | 20 - 23 |
| 445                                                                | M8          | 27.4 - 31.4       | 2.8 - 3.2 | 20 - 23 |
| 454 *1                                                             | M8          | 15.7 - 17.7       | 1.6 - 1.8 | 12 - 13 |
| 481                                                                | M6          | 10.8 - 12.8       | 1.1 - 1.3 | 8 - 9.4 |
| *1: Apply LOCTITE 241 (thread locking agent) to threaded sections. |             |                   |           |         |

## Brake Valve

### 2. Description of operation

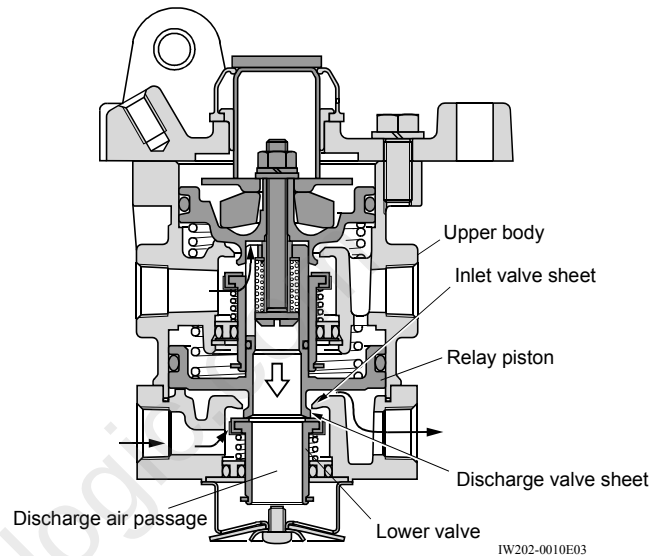
#### 2.1 Generation of air pressure

1. When the pedal is depressed, the depressing force is transmitted through the plunger, spring seat, and rubber spring to the piston. The piston moves down, compressing the return spring.
2. The discharge valve seat at the bottom of the piston makes contact with the upper valve, closing the discharge passage at the center.
3. As the piston further compresses the return spring, it moves the upper valve, opening the air inlet valve seat on the upper body.
4. The pressurized air supplied from the primary supply port flows through the delivery port to the brake in the primary system.



5. On the other hand, as the primary system becomes operational, part of its pressurized air flows through the passage in the upper body into the space above the relay piston in the secondary system. This pushes the relay piston down.
6. The discharge valve seat at the bottom of the relay piston comes into contact with the lower valve, closing the discharge passage at the center.

7. The lower valve moves further down, opening the air inlet valve seat on the lower body. This allows pressurized air from the secondary supply port to flow through the delivery port into the brake chamber of the secondary system.



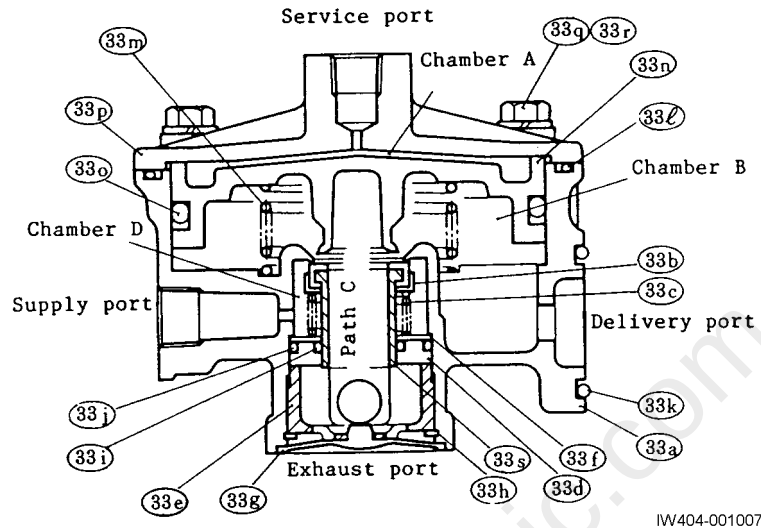
#### 2.2 Stabilization of air pressure

1. When the pedal is depressed to a certain extent and kept stationary at that position, the air pressure is stabilized at a level corresponding to that pedal position as follows:
2. As the pedal is depressed, the discharge valve closes and the inlet valve opens to deliver air to the system.
3. This air also exerts upward pressure on the underside of piston.
4. With the pedal maintained at a certain depressed position, the air under piston pushes up piston by compressing rubber spring above the piston.
5. Piston, while keeping contact with upper valve, rises until upper valve comes into contact with the inlet valve seat to stop the delivery of air.
6. Then, with the discharge valve seat in contact with upper valve, the air pressure remains stable.

## Booster

### 3. Principles of operation

### 3.1 Relay valve



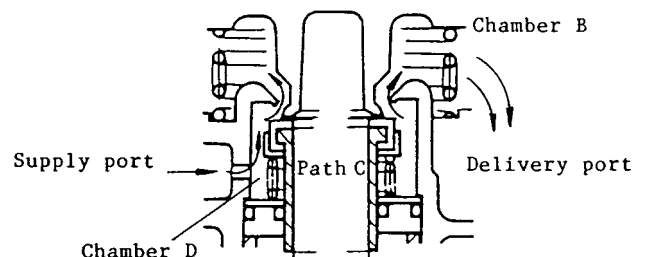
### 1. Booster not in operation

The above figure shows the state of the relay valve when the booster is not in operation. Since chamber A is open to the atmosphere via the brake valve, piston 33n is held in its raised position by return spring 33m. In this state, chamber B is also open to the atmosphere through path C.

## 2. Booster in operation for assisting braking

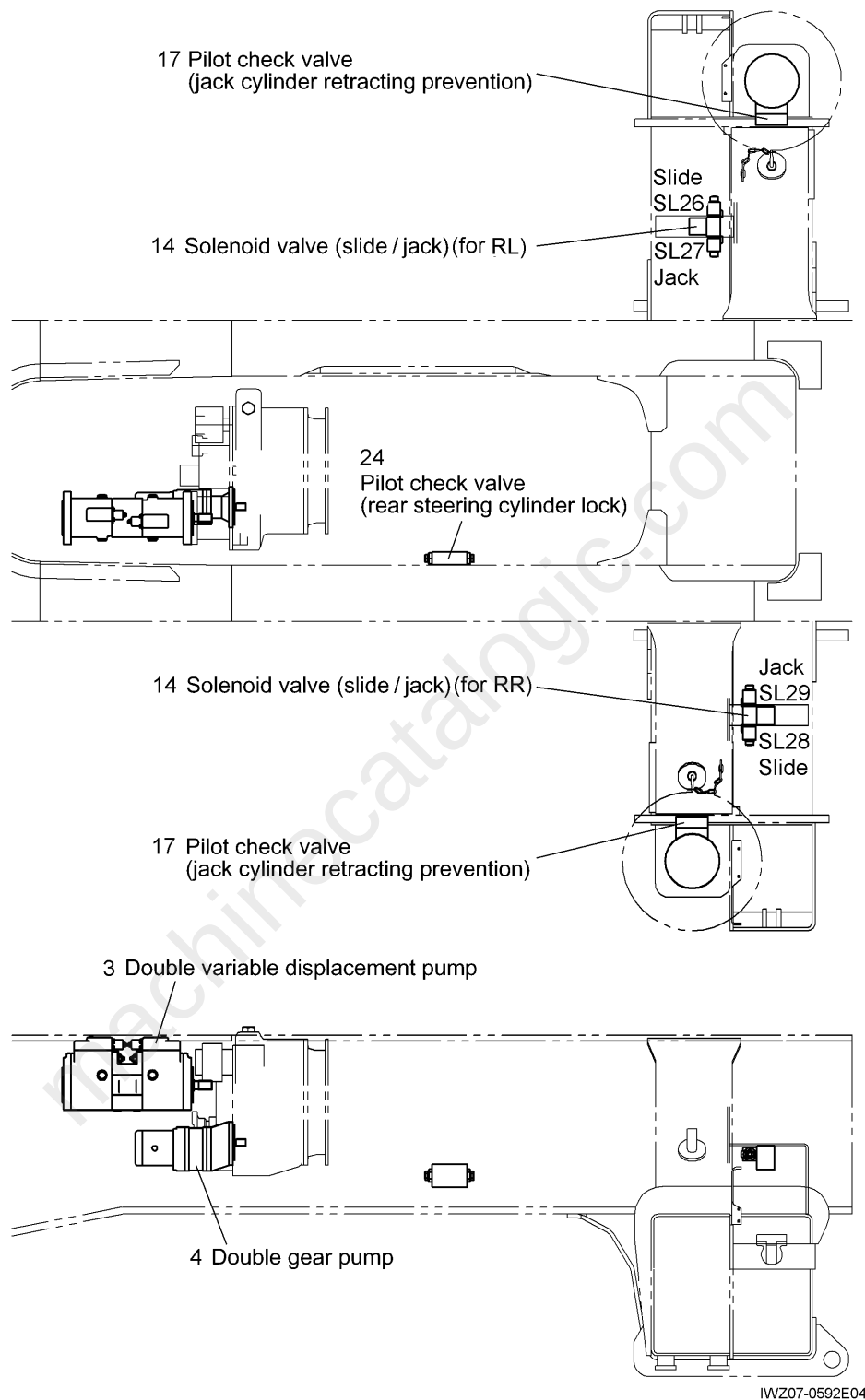
When the brake pedal is depressed, the signal pressure is applied to the service port. This pressure acts on piston 33n and the piston compresses return spring 33m, bringing the piston seat in contact with valve assy 33s. This causes chamber B to shut off path C, and simultaneously the valve assy is pressed down. As a result, the body seat opens, allowing compressed air to flow from chamber D to chamber B, to delivery port, and then to the air cylinder.

Booster in operation



## Location of Hydraulic Parts (Lower)

### 1.3 Rear



List of components illustrated in the “Rear” figure (in alphabetical order)

- |                                                             |                                                       |
|-------------------------------------------------------------|-------------------------------------------------------|
| 4. Double gear pump                                         | 14. Solenoid valve (slide/jack) (for RL) (SL26, SL27) |
| 3. Double variable displacement pump                        | 14. Solenoid valve (slide/jack) (for RR) (SL28, SL29) |
| 17. Pilot check valve (jack cylinder retracting prevention) |                                                       |
| 24. Pilot check valve (Rear steering cylinder lock)         |                                                       |

## Full Version Available

### Tadano GR-700EXL-1 Rough Terrain Crane Service Manual

Tadano GR-700EXL-1 rough terrain crane service manual with repair procedures, adjustments and troubleshooting for the main systems. Instant PDF download.

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